

REMARKS

Claims 18-34 are pending in the application. The status of the claims and issues related to the specification are identified below:

Claims / Section	35 U.S.C. Sec.	References / Notes
Drawings	Objection	<ul style="list-style-type: none">• Lacking features in the claims
Specification	Objection	<ul style="list-style-type: none">• Reference to drawings
20-34	Objection	<ul style="list-style-type: none">• Various objections
21-34	Objection	<ul style="list-style-type: none">• Allowable, but dependent on a rejected base claim.
18, 19	§102(b) Anticipation	<ul style="list-style-type: none">• Roney, et al., (U.S. Patent No. 5,528,474).
20	§103(a) Obviousness	<ul style="list-style-type: none">• Roney et al., (U.S. Patent No. 5,528,474); and• Zouzoulas, et al., (U.S. Patent No. 5,059,778).

5 Applicants have amended claims 18, 20, 21, 23, 27 and 31, and have added claims 35-37. To address the issues raised by the Examiner. Claim 21 has been redrafted in independent form to include the claims from which it depends, including pre-amendment claim 18. Applicants have further amended the Specification and Drawings (attached as the Appendix, with drawing changes highlighted), and have provided discussion for distinguishing the present invention from the art cited against it. Applicants believe that these changes do not introduce new matter.

Applicants thank the Examiner for indicating the allowability of claims 21-34.

OBJECTIONS TO THE DRAWINGS

1. *The drawing figures have been amended in accordance with the Examiner's instructions.*

Figure 1A has been amended to include the addition of the thermally
5 conductive paste/adhesive/film and reference character 6. Support for this amendment can be found in claim 18. The Specification has been amended to more clearly illustrate this; however, this does not constitute the addition of new matter because, based on the description found in claim 18 such an addition could easily be inferred by one of ordinary skill in the art.

10 Figure 2B has been corrected so that the lenses are correctly identified by reference character 5 instead of reference character 4. Figure 2B also now correctly illustrates the LEDs that proceed that are electrically combined into lanes by the addition of reference character 7. Figure 2B does show these lanes, but they are shown in cross section—the lanes extend in a direction
15 perpendicular to the plane of projection from each shown diode. The Specification has been amended to clearly state this; however, this does not constitute the addition of new matter as the extrusion of the cross section would obviously produce such lanes.

Figure 2D has been added to show the singly angled surface. Support for
20 this addition can be found as a partial cross sectional view of Figure 2C. Figure 2C actually shows the multiply angled surface, albeit not in cross section. The Specification has been amended to describe Figure 2D, but this does not constitute new matter as a partial cross section of Figure 2C would obviously produce what is shown in Figure 2D.

Applicants believe that these drawing changes address all of the Examiner's concerns. Applicants respectfully request that the objections to the drawings be withdrawn from the application.

OBJECTIONS TO THE SPECIFICATION

- 5 2. *Applicants have amended the Specification to correctly refer to Figure 1A instead of Figure 1.*

Applicants thank the Examiner for pointing out this typographical error.

OBJECTIONS TO CLAIMS 20, 21, 23, 27 AND 31

3. *Applicants have amended the claims to properly address the*
10 *Examiner's objections.*

Claim 20 has been amended to remove the phrase "particularly a flex board". This phrase has been included as the subject matter in dependent claim 35.

- Claim 21 has been amended to change "secondary side" to "secondary
15 surface" in accordance with the suggestion by the Examiner.

Claim 23 has been amended to remove the phrase "particularly copper or aluminum or sheet metal". This phrase has been included as the subject matter in dependent claim 36.

- Claim 27 has been amended to remove the phrase "preferably in the form
20 of a polyester or polyamide film". This phrase has been included as the subject matter in dependent claim 37.

Claim 31 has been amended to correct the word "lines" to "lanes".

Applicants believe that these amendments fully address the Examiner's objections and therefore respectfully request that the objections to the claims be withdrawn from the application.

35 U.S.C. §102(b), CLAIMS 18 & 19 ANTICIPATION BY RONEY

- 5 4. *Applicants have amended claim 18 to provide that the metallic layer provided on the secondary surface is electrically insulated from the LEDs.*

Claim 18 has been amended to provide that the metallic layer provided on the secondary surface is electrically insulated from the LEDs.

Roney et al. discloses a vehicular lamp with an array of LEDs on the
10 principal surface of the printed circuit board, the LEDs having electrical terminals (22), as shown in Figure 3, on the backside of the LEDs. Therefore the terminals have to be electrically connected to the circuit board, e.g., by soldering, and before injection of the thermally conductive medium (14) (column 2 lines 54-59). Hence the copper layer on the secondary surface of the printed circuit board is a
15 necessary requirement for the electric power supply of the LEDs on the principal surface. This implies an electrical connection between copper layer and LEDs.

According to claim 18, the LED arrangement of the present Invention comprises a surface mounted plurality of LEDs. An important factor in surface mounting technology is that all terminals for electrical power supply of the LEDs and
20 the LEDs are on the same surface of the circuit board. Therefore the electrical current conduction only takes place on that surface of the circuit board the devices are mounted on.

In case of the present invention, this surface is the principal surface, in contrast to the mounting technology used in Roney et al. In the present invention, the electrical current conduction also takes place on the surface opposite of the LEDs, which surface is the secondary surface in Roney et al. This can be seen
5 from Figure 2 and Figure 3 and from the description of the drawings (column 2 lines 43-56; column 3 lines 18-31) in Roney et al., where it is explicitly disclosed that the copper layer which is directly clad to the backside of the circuit board is responsible for the power supply of the devices on the primary surface of the board via the terminals.

10 In the present invention however the metallic layer on the secondary surface has the main object of conducting heat away from the LEDs and is not involved into electrical conduction. It is therefore electrically insulated from the primary surface of the circuit board. If it were not, shorts would occur.

Claim 18 has been amended to highlight this distinction. In line 4 of claim
15 18 the phrase "electrically insulated from the LEDs," has been inserted directly following the phrase "a metallic layer provided on said secondary surface,". Support for this amendment can be seen from figure 1A, where no conductive connection between the metallic layer 3 and the LEDs is present, and from lines 18 to 24 on page 4 of the specification of the present invention, for example. Roney et al,
20 does show a conductive connection between the LEDs and the copper layer on the secondary surface. Hence the subject matter of claim 18 is new.

Furthermore a conductive connection between the LEDs and the copper layer on the secondary surface is a necessary requirement for the power supply of

the LEDs in Roney et al. A metallic layer on the secondary side being electrically insulated from the LEDs on the primary side is not compatible with the device disclosed in Roney et al. Thus the subject matter of the amended claim 18 is not obvious in view of Roney et al.

5 Since claim 19 depends from claim 18, for the reasons cited above, claim 19 (with claim 18 as amended) is not anticipated by Roney.

For these reasons, the Applicants respectfully request that the Examiner withdraw the 102 rejection from the present application.

35 U.S.C. §103(a), CLAIM 20 OBVIOUSNESS OVER RONEY IN VIEW OF ZOUZOULAS

10 5. *Applicants rely on the amendment to claim 18 and the arguments provided above and assert that the combination of Roney and Zouzoulas do not teach or suggest the present invention.*

Claim 18 has been amended to indicate that the metallic layer provided on the secondary surface is electrically insulated from the LEDs. Applicants rely on this amendment and the argumentation above, and assert that Zouzoulas does not teach or suggest this feature either alone or in combination with Roney. The Examiner cites Zouzoulas as teaching a flex board.

For these reasons, the Applicant asserts that the amended claim language clearly distinguishes over the prior art, and respectfully request that the Examiner withdraw the §103(a) rejection from the present application.

CONCLUSION

Inasmuch as each of the objections have been overcome by the amendments, and all of the Examiner's suggestions and requirements have been

Appl. No. 10/009,656
Reply to Office Action of May 19, 2003

satisfied, it is respectfully requested that the present application be reconsidered,
the rejections be withdrawn and that a timely Notice of Allowance be issued in
this case.

Respectfully submitted,

Mark Bergner (Reg. No. 45,877)

Mark Bergner
SCHIFF HARDIN & WAITE
PATENT DEPARTMENT
6600 Sears Tower
Chicago, Illinois 60606-6473
(312) 258-5779
Attorney for Applicants
Customer Number 26574

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the
United States Postal Service as First Class Mail in an envelope addressed to:
Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on July 28,
2003.

Mark Bergner Attorney for Applicants

Appl. No. 10/009,656
Reply to Office Action of May 19, 2003

APPENDIX
DRAWING CHANGES